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DEPARTMENT OF AGRICULTURE.

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EDITORIAL NOTES—JUNE, 1920.

A Committee of Management has been appointed to take the necessary steps to establish the Dairy Scheme at Tailevu, for Returned Sailors and Soldiers, consisting of Mr. Crompton, O.B.E., Chairman; Mr. E Duncan, the Government Veterinary Officer, Lieut-Colonel P. Hall, D.S.O., (nominated by the Returned Sailors and Soldiers Association) and the Superintendent of Agriculture. The Committee has commenced work on various preliminary matters.

Several specimens of coconut leaflets from Vanualevu have been received showing brown dead areas. In most cases these dead patches are due to the larvæ of the coconut leaf-mining beetle, *Promecotheca reichii*, a pest common to all parts of the group. The patches are narrow at one end and widen out gradually, generally down the leaflet. At the narrow end, and on the underside of the leaflet is a small brown more or less hemispherical object, which is the case containing the egg of the beetle. The larva which hatches from the egg eats its way in between the leaf surfaces and spends its whole period of existence as a larva and pupa there, turning when fully fed into a black and yellow beetle rather over $\frac{1}{4}$ in. long. The presence of an oval hole about $\frac{1}{4}$ in. long in the upper sufrace of a dead patch means that the adult beetle has energed. The larvæ are subject to the attacks of parasites which in general keep the pest in check. Patches in which the parasites have been active are generally small, that is up to $1\frac{1}{2}$ inches long, whereas the patch of a miner which completes its life history is up to 5 inches long. The parasite escapes from the patch by a hole about the same size as that made by a common pin. It is not unusual for pests kept in check by parasites to increase in number at times, generally at more or less regular intervals, so that their occurrence resembles a series of " waves," due to the fact that as the parasites increase and destroy the pest, they themselves must suffer from the lack of sufficient food, allowing the pest to get ahead of them temporarily. It is particularly likely to happen when any other factor contributes to reduce the parasites. On three separate occasions the attacks of the leaf-miner have been particularly severe after storms, hence it is reasonable to suppose that the parasite suffers more than the beetle during storms. The present " wave " of the leaf-miner is considered to be partly attributable to the storm of last year.

The *Tropical Agriculturist* (Ceylon) January, 1920, has a note referring to a bunch of coconuts obtained from the N.W. Province which bore both yellow and green nuts. The main stalk of the bunch was longitudinally striped with green and yellow, the side branches which arise from the green areas being green and bearing green fruit, while those arising from yellow areas were yellow and bore yellow fruit. Nuts of each colour were planted and the character of the resulting palms are being closely watched. It is pointed out that the interest of the case lies in the indication that yellow varieties of coconuts may have originated as "sports" from normal green varieties and the practical bearing of this is that since the yellow colour is due to a deficiency or masking of "chlorophyll," the green colouring matter of plants, the yellow varieties may be of slower growth than green varieties and therefore less profitable than green varieties. In Fiji it may be possible to find, amongst the millions of coconut palms under cultivation, some similar occurrence. Some of the varieties which are given most excellent characters by coconut planters in Fiji have orange yellow leaf stalks and nuts.

REPORT ON AN INVESTIGATION OF MATTERS AFFECTING CATTLE AND HORSES IN THE DISTRICTS OF BA, LAUTOKA AND NADI.

By WAKEFIELD RAINEY, Government Veterinary Officer.

The investigation was carried out continuously between 19th March and 20th May, 1920. The time taken for each district was:—Ba, 25 days; Lautoka, 11 days; and Nadi, 26 days.

2. Work done includes the individual inspection for contagious disease of approximately 17,000 cattle and 4,500 horses and mules, the classification either for registration or castration of 305 stallions, and a detailed examination of grazing lands, fodder, trade, and other circumstances of stock-production. It may be recorded for the guidance of those required to do similar work in the future that to complete the inspection of all stock within the periods stated it was necessary to be in the field for ten hours daily on six days a week and to cover approximately 1,000 miles on horse back. It should also be recorded that the energetic assistance of the police in each district was the chief factor of success in an attempt to perform the task systematically. The whole-time services of at least one native constable are essential in work of this kind, and this assistance was kindly given to me.

CENSUS OF STOCK.

3. The approximate numbers of cattle and horses (including nules) in the districts at present are:—

District.	*Cattle.*	*Horses & mules.*
Ba	6,500	2,250
Lautoka	3,250	1,000
Nadi	8,000	1,500
Total	17,750	4,750

LANDS AND GRAZING.

4. There is no great difference in the matter of land and grazing in Ba and Lautoka from the conditions already recorded in my report on Colo North.

5. In certain areas, especially in Lautoka, there is a more abundant and widespread growth of trefoil. In the report on Colo North it is stated that this trefoil grows too close to the ground to afford grazing for cattle; on further observation I find that in gulleys and well-watered hollows it does in fact afford a considerable amount of grazing for cattle, more especially for those that have learned in the hard school of necessity to nibble like sheep. The " panicum " grass mentioned in my report on Colo North is also found more widely spread in Lautoka and Ba.

6. This grass is found (as couch grass is found) especially in the vicinity of roads and existing, or former, habitations

7. The more one observes it, and the liking which stock have for it, the more one is convinced that it is the best upland grass so far known in Fiji.

8. I would strongly recommend all those who are interested in forage grasses to experiment with this grass by forming plots and collecting seed for further sowing.

9. The following gentlemen know the grass and will no doubt be pleased to point it out to those who fail to identify it from the description in the report on Colo North:—Mr. E. D. Francis, Tavua; the Hon. Mr. Clapcott, Ba; and Mr. J. Sinclair, Lautoka.

10. It may be found as a sward along the roadside in most places from Nadi to Tavua, or in such places as the paddock opposite the butcher's shop at Lautoka.

11. In Nadi the land and grazing to the north are similar to those of Ba, but to the south they become progressively poorer for stock. The worst pasture I have observed in Vitilevu is to be found in that area of which Yako is about the centre. The prevailing grass in that area is a moderately tall, wiry, bent and knotted grass, easily distinguished by its tendency to wither to a russet colour, and by its terminal seed-head (usually given off at a slight angle to the stem) having long brown awns, twining together at their tips, and downy seed coverings.

12. This grass is not only entirely useless as a fodder, it is on account of its wiry nature positively bad and may be classified with the brome and darnel of Europe. In the south of Nadi where it merges into Nadroga this grass is found covering the hills to the exclusion of all other grasses. Cattle running on this land are dwarfed and emaciated. For descriptive purposes this grass will be referred to in my future reports as "Nadi" grass.

13. Land where it prevails may be discounted in estimating the acreage required for cattle because the animals will have to rely for their subsistance on such other grasses as they can discover hidden away in gulleys, on the roadsides, or on the sites of abandoned cultivation or habitations.

Cattle and Breeding.

14. So long as it only pays Europeans to cultivate the best land in the dry belt of Fiji and that only for tropical produce, cattle-production in the districts under review must remain (as it is at present) a by-product of the need of the Indian small-holder to breed working bullocks. Cattle are only seen in fat condition where they have access, either by hand-feeding or grazing on river banks and rich "pockets," to the forage grown in decent soil; most of the cattle on the uplands have to struggle for a precarious existence.

15. There is much absolutely sterile or barren land among the foothills, land in which not even the guava will grow.

16. Large areas of the foot-hill land are appropriated for native cattle runs or "gates" as they are locally termed.

17. A "gate" consists of a rough barbed-wire stockyard placed adjacent to an unfenced cattle run of up to 10,000 acres running a mob of up to 500 cattle.

18. The owner or keeper of the "gate" receives cattle as boarders in return for a weekly payment of about sixpence a week from landless natives and runs them with his mob. In most cases it appears that the "gate" proprietor keeps no books and gives no descriptive receipt so that a beast once admitted to the "gate" may ultimately be restored to its owner—and may not. Of course this free-and-easy arrangement leads to trouble and often involves grave suspicion of fraud. Most of the "gate" cattle inspected by me were in poor condition.

It would seem advisable to introduce legislation providing for:—

1. The compulsory registration of "gate" proprietors.
2. The issue of receipts for any cattle the property of other persons taken into the run.
3. The keeping of adequate descriptive records of stock in hand and of stock issued and received.

19. As already stated cattle are bred chiefly in these districts for draught purposes; consequently in deciding what are the most suitable breeds it is necessary to give preference to those that make the best working oxen.

20. My observations point beyond any question of opinion to the great superiority of the Shorthorn over other European breeds in Fiji for the production of big bullocks. An improvement on that breed for draught purposes in the dry belt of Fiji could only be made by introducing a certain amount of Zebu blood.

Sheep.

21. No sheep were seen in Ba, Lautoka or Nadi, but I am perfectly satisfied that sheep could be produced and maintained in many parts of the foothills in much more satisfactory condition than cattle.

Horses.

22. The country inspected was not on the whole suitable for breeding any but light horses, ponies or mules.

23. The best class of light horses seen were those bred in the Fiji towns in the hills.

24. The superiority in stamina and physique of horses bred in many Fiji towns as compared with those bred on Indian and most European holdings is very evident to those who have made systematic observations in the matter.

25. The reason is that in the Fiji towns the young horse often finds ideal conditions for its development; abundant grazing; perfect freedom in company with other horses; an absolute immunity during the earlier stages of his life from those twin curses, the tether rope and the small or overstocked paddock, which jointly or separately prevent the youngster from expanding its lungs and duly exercising its heart and limbs, or from obtaining adequate nourishment.

26. Among the heavier class of horses I observed some fairly good examples of Suffolk Punch and I am disposed to couple this breed with the Percheron in my idea of a suitable draught horse for Fiji. I would commit myself definitely here to the opinion that the heavier breeds of Clydesdale or Shire are generally unsuitable for the conditions met with in Fiji, and that crosses with the stallion of those breeds do not succeed often enough to justify the procedure.

Serious practical objections to the heavy breeds of horses in Fiji are:—

1. A marked liability in certain areas to a form of inflammation of the skin of coronets followed by gangrene or grease caused by the penetration of grass seeds which become attached in great numbers to the hair of the legs. The grass seeds, pentrating the outer layers of the skin above the foot at hundreds of points, expose the lower layers and underlying tissues to infection by the bacteria contained in mud and stable dirt. The lighter-bred, clean-legged animals are relatively free from this objection.
2. A tendency to heat apoplexy and functional disorder of the heart when working at a smart pace in disc ploughs in the hot weather. The pace of the heavy draught horse is normally less than required by custom on Fiji plantations, and when the heavy and lighter more active types of animals are yoked together the driver tends to force the pace to that of the fastest animal. Heavy horses suffer from heat apoplexy on plantations to a greater extent than is generally recognised. Planters are prone to regard as heat apoplexy only those cases that actually succumb

while at work in the field, but I observed during the mid-day rest instances of animals off their feed and blowing heavily with high temperatures that were undoubtedly mild cases of heat apoplexy. Successive slight attacks of this disorder undermine the constitution by weakening the heart until the horse either drops dead at work or gets into a low state of health and condition which permanently impair its usefulness.

27. More thoroughbred blood is required and I would advise intending importers to select only small horses of stocky build.

28. The leggy thoroughbred horse is most unsuitable for breeding from in Fiji.

29. The grazing and feeding generally in this country will not as a rule produce, under the necessarily natural conditions of early development, large horses of any type possessed of the requisite stamina and heart-power. Consequently, whether it is desired to breed thoroughbreds or draught horses, small stocky animals of the type concerned should be selected to breed from.

30. If the yearning for bulk is so intense that the breeder cannot resist it, then let the dam have the bulk. The big dam can better supply an abundance of milk for the offspring of a small sire than can the small dam sustain the offspring of a big sire.

31. For thoroughbred breeders in the alluvial areas who desire that their colts should grow into racehorses, my advice is that they should send the mare and foal to a selected Fiji hill town until the youngster is 18 or 20 months old.

32. They will hardly develop satisfactorily in the stock-yard of a plantation or on an alluvial fallow. I would enter a strong plea for the more liberal feeding of plantation mules and horses. With some exceptions (notably Mr. Coffey's plantation in Ba and the Nadi planters, especially Mr. Robert Carr whose animals are in the best condition of any working stock I have yet seen in Fiji). I found the plantation horses and mules as a rule in poor condition

33. The grain ration allowed by the Colonial Sugar Refining Company and by some private planters is too low for animals doing hard work. For animals doing hard work a ration of 8lb of maize daily in addition to green stuff and molasses should be allowed. Maize is cheap and plentiful in Fiji and there is no excuse for failing to allow a fair grain ration to the working animals.

34. The Indian is by instinct a pastoralist and has the Eastern joy in fatness and plenty, consequently he will work better and more efficiently with well-fed stock around him. It is recorded somewhere in Roman history that a renowned Senator, being also a most successful farmer, was asked the secret of his success on the land. He replied, "Feed stock well." Not being satisfied his questioner pressed for further information only to receive as a laconic final reply, "Feed stock."

35. All through the civilised world big commercial firms and corporations find that it pays them to feed working animals generously. Sore shoulders, a prominent cause of inefficiency among plantation animals, are mostly seen affecting animals in poor condition.

26. Apropos of this it occurs to me as strange that one sees no breast harness on plantations. In other parts of the world it is found less productive of sore shoulders than are collars.

DISEASE.

37. Again it is satisfactory to record that there is little contagious disease to b found except nodular worm disease in under-fed cattle.

38. As in Colo North a small percentage of tuberculosis exists. The low rainfall and abundant sunshine, the absence of shade cast by trees, dense undergrowth, or herbage, are the chief opponents of this disease and effectually limit its spread. I believe that if a systematic inspection of cattle in the dry belt, with slaughter of all clinical cases, can be carried out for three years on the same lines as my recent inspection the disease will be practically eliminated.

39. This belief is based on the following reasoning:—

1. A careful individual examination of all cattle failed to reveal clinical cases of tuberculosis to a greater extent than 5 per 1,000 and these cases were all destroyed forthwith.
2. During the preceding years of no inspection or slaughter, similar clinical cases in a more or less advanced stage of the disease must have lingered on, remaining infective sometimes for years.
3. The infection of tuberculosis would naturally be spread more by advanced open clinical cases than by cases showing no symptoms of disease.
4. Consequently if under past conditions of no interference with advanced clinical cases the disease has made no more headway than as revealed by my inspection, then under conditions of successive annual inspection and immediate slaughter of obviously affected animals the amount of disease in the future will be infinitesimal, or it will be entirely eradicated.

For areas and herds in which little or no tuberculosis has been found one yearly inspection of stock will suffice, but a half-yearly, or better still, a quarterly inspection should be made of areas and herds where the disease is found most prevalent.

Since my Colo North report was submitted much further opportunity has been given me to observe the condition known as "Fiji disease," and in the light of this experience I am bound to modify some of the opinions expressed in that report so far as those cases affecting the eyes of cattle and the limbs of horses are concerned. After examining several of these cases and operating on some I find that there exists in most instances a distinct tumour growth of a fibro-fatty nature having its own arterial supply and capable in its earlier stages of being enucleated or "shelled out" from the surrounding tissue after a preliminary dissection of the latter where it adheres to the tumour. If the tumour is effectually removed and the wound is subsequently dressed with a fly-preventing antiseptic dressing a complete cure may be expected, but if even a portion of it with its own blood supply is left it will recur.

40. It is a benign tumour usually simple, but sometimes multiple, resembling the well-known "wart" of horses in temperate climates; it is not malignant and has nothing whatever to do with cancer.

41. The disastrous effects observed in neglected eye-cases in cattle are due to the unhindered growth of the tumour amid the soft tissues of the orbit causing their degeneration and gangrene and the production of a fetid pus.

42. This stinking pus contains bacterial toxins, which being slowly absorbed into the circulation, ultimately kill the animal from what is known as Sapræmia.

43. The rule should be early operation and daily antiseptic dressing.

44. With very little care the beast can at least be saved long enough to fatten it for the butcher; a moderate amount of surgical skill will cure it altogether; and only under conditions of complete neglect will sapræmia set in and destruction become necessary.

45. Among the denser tissues of the limbs of horses or mules the growth of the tumour is much slower and successful operative treatment is possible after a long period of neglect.

46. Occasional cases of a similar sort are found in the scrotum following the castration of bulls, and here again removal of growth by simple operation with subsequent dressing will effect a cure.

47. A chronic skin disease is found affecting horses on the coast levels.

48. It appears to be a form of parasitic mange, but to be only slightly contagious, thereby greatly differing from the parasitic mange of other countries. Some local opinion attributes the condition to the irritation caused by mosquitoes or a biting fly, but if this were the cause one would expect to find the disease affecting the better-bred, thin-skinned imported thoroughbreds and hacks ridden by European planters, whereas in fact these horses do not appear to be attacked.

The distribution of the affected cases is limited to certain areas; the activity of mosquitoes is certainly not thus limited and there is nothing to suggest the prediliction for certain areas of any other biting flies in country so similar in all respects as is that of the district under review.

49. I think that these horses, and for the most part plantation working animals, are not attacked behause their skins are kept by grooming or washing in a relatively clean state.

50. Affected animals almost without exception are the proprety of Indians and are dirty.

51. Conditions of dirt and neglect notably favour attack by skin parasites and it is on this reasoning that I attribute the cause to a parasitic insect and not to a biting fly. There has been no opportunity during my tour to examine microscopically scrapings from the skins of affected animals, but this will be done later and the matter will be cleared up.

52. In the meantime the following treatment should be practised:—

1. Clip and if possible singe the animal.
2. Cleanse the entire skin thoroughly by washing the animal from head to foot with soap and hot water.
3. Dress the affected areas of skin thoroughly with the following dressing and wash it off with hot water and soap on the third day; continue the treatment for thirty days:—Sulphur, 2lb; creasote, ¼ lb; coconut oil, 1 gallon.

53. It is of great benefit to the treatment to exercise the animal frequently so as to sweat it well, and thus make the skin clean itself, so to speak.

54. If at any time during the treatment the skin shows signs of inflammation by becon ing very scurfy and tender to the touch, the treatment should be discontinued until the skin is again normal.

55. Some soaps will inflame the skin.

56. Planters are suffering in the aggregate considerable losses by the death and chronic disability of working horses and mules resulting from neglected or improperly treated wounds, foot injuries and grease.

57. In the older and more closely settled areas ,as around Rarewai in Ba, the soil has become more or less heavily charged with the bacilli of tetanus or lock-jaw, malignant œdema and of necrosis.

58. Wounds of the feet and legs of animals standing in dirty stalls or stock-yards tend to become seriously infected. During my brief tour in

Ba and Lautoka I saw three animals actually dying from tetanus and blood-poisoning. I heard of several recent losses, and I observed on plantations throughout Ba, Lautoka and Nadi many cases of chromic deformity and disability which were the sequels of neglected foot injuries and grease.

59. Much of this inefficiency and loss could be avoided by providing dry sanitary standings for animals in the stable and stable-yard, and by the prompt application of rational first-aid treatment.

60. Every stable should contain a farrier's knife, and every stable sirdar should be taught how to pare away the horn of the sole of the foot over the site of a picked-up nail or stone bruise in order to give harmless vent to the pus or "matter" which is accumulating under pressure at the point of injury.

61. The usual practice on plantations is to apply a poultice and to go on poulticing until the pus breaks out at the back of the heel or the coronet.

62. This practice is dangerous and often leads to quittor or blood-poisoning.

63. Poulticing on the whole does much more harm than good. As usually applied it becomes a septic mass capable of any evil when placed in contact with injured tissues.

64. The only legitimate use of a poultice in these days of rational surgery is its application for one night to soften the horn in order to facilitate the paring to be done next day. So soon as the soft tissues of the foot are exposed the rational treatment, after removing all under-run horn, is to give foot baths of antiseptic solution and to apply to the foot (retain in position by a piece of sacking) a pledget of tow soaked in the following or other similar dressing:—Camphor, 4 drachms; creasote, 2 drachms; turpentine, 2 ounces; coconut oil, 10 ounces.

65. At a later stage Stockholm tar makes a good foot dressing.

66. Similarly, in wounds of the limbs or body, bandaging should generally be avoided and the wound should be treated by irrigation with cold water, followed by the application of the above oily dressing to keep off flies. Irrigation in some form or other is now recognised as the only scientific treatment of serious wounds.

67. Wounds may be irrigated in various ways, often it is most convenient to stand the patient in a running stream for half an hour twice daily.

68. Where the animal is too severely injured to move, the wound may be irrigated by a simple syphon arrangement of rubber-tubing depending from a bucket hanging from an overhead beam.

A simple and effective irrigating apparatus is:—

1. Make a hole about $\frac{1}{8}$ in. to $\frac{3}{16}$ in. diameter in the bottom of a kerosene tin.
2. Through the hole from below pass the end of a long piece of stout twine and secure it within the tin by tying it to a thin French nail.
3. Fill the kerosene tin with water and hang it from an overhead beam or post.
4. Lead down the string to the wound and keep it in contact with the upper margin of the wound by a loose sling of thin wire or other simple device.
5. The water will flow out very slowly through the hole in the bottom of the tin and will be carried by gravity and capillary attraction down along the string to the wound which it will gently irrigate.

69. By means of irrigation bacteria are continuously and mechanically floated off the wound surface and removed. The subsequent application

of an antiseptic oily dressing as described above prevents re-infection of the wound by flies and healing is thus made easy.

70. After a varying period of treatment by irrigation the wound is filled by healthy granulations, and may be dried off and healed by the application tincture of iodine or other astringent dressing.

71. A good, simple treatment for grease is as follows:—

1. Pare away the ragged under-run portions of frog.
2. Wash the affected parts thoroughly each evening with soap and warm water.
3. After washing the affected parts, dry thoroughly by gently rubbing in dry bran.
4. Then swab well with the following lotion:—Copper sulphate, zinc sulphate, alum sulphate, of each half an ounce; water to fill one whisky bottle; dress twice daily.

72. It is necessary, for the proper treatment of grease, for the animal when in the stable or yard to have a dry, well-limed standing.

73. Grease is often incurable (scientifically it is an aggravated form of moist eczema), but it may as a rule be kept under control by the systematic application of a routine treatment as described above.

A considerable amount of evidence was found, chiefly in the foot-hills, of nodular-worm disease in cattle (see *Agricultural Circular* for January, 1920), but in no case was it found adversely affecting well-fed stock. The only danger to be apprehended from this disease in Fiji (so far as I have been able to ascertain) is that it hinders the development and often causes the loss of under-fed store cattle and calves.

The only remedy that I can suggest as a routine measure likely to have any appreciable effect on so widely-spread a condition is that the attempt should not be made to run store cattle on bad or overstocked land.

Trade.

74. The Colonial Sugar Refining Company undertake by means of their butcheries at Ba and Lautoka the supply of fresh beef for these districts and also for Nadi. They pay for cattle at the rate of 25s. a hundred pounds (dead weight). Apart from the sales involved in the supply of cattle to these butcheries (about twelve animals weekly) small sales of working oxen and cows within the districts, and occasional export of store cattle to the Rewa, there is no cattle trade of any importance. Most of the cattle killed for meat at the Colonial Sugar Refining Company's butcheries are working oxen that have become unsuitable for draught either on account of age or because they have become too fat and lazy. The result of this is that the European community in the districts are as a rule required to eat for lack of any alternative that sort of fresh meat known in South Africa, and by all who served in the South African war, as "trek ox."

75. In the process of working the muscle fibres of the ox become greatly thickened and, where nature considers that reinforcement is needed, strengthened by the addition of much fibrous tissue.

76. Consequently the beef from such an animal has acquired qualities quite different from those expected by the epicure who (unlike Samson) finds strength where he hoped for sweetness.

77. The reason why these working oxen are bought for the butcheries instead of good young beef is that the price paid by the Colonial Sugar Refining Company, though ample for a discarded working ox, is not enough to secure a three-year-old bullock or heifer.

78. An old working ox, fairly fat, will often weigh 800 lb and can usually be bought for £6 (six pounds) or less. At 25s. a hundred pounds such a transaction yields a handsome profit to the European agent who buys for

the Company. On the other hand the Indian small-holder will demand for his three-year-old fat bullock, not yet broken to the yoke, at least £6. Such an animal will not weigh more than 500 pounds, consequently there is, at 25s. a hundred pounds, no profit in the transaction for the European agent; therefore the animal is not bought.

79. A practical remedy would be for the Colonial Sugar Refining Company to offer two distinct prices for cattle; say, 20s. a hundred pounds for the "trek ox," if they want him, and 40s. a hundred pounds for prime beef, specified to be bullocks or heifers or cows not over four years, not worked, and in tip-top condition.

80. I am in a position to assure the Company that there is an abundance of such prime beef to be obtained at the prices quoted, but that very little good beef can be bought in the dry belt of Fiji to yield an agent's profit at 25s. a hundred pounds. An addition of 10s. a hundred pounds to the existing price means an increase in cost of slightly over one penny a pound, but good meat means the adequate nutrition of the Company's servants and their wives and families.

81. The class of meat supplied at present is on the whole unsuitable for human food except for robust adults with first-class teeth and digestion; even for these the percentage of nutrition, or what is termed scientifically the "coefficient of digestibility," is probably 25 per cent. less than that of good beef for which they might be called to pay 20 per cent. more.

Conclusion.

82. My observations point to the advisability in the interests of economy, humanity and public health of having a qualified Veterinary Practitioner permanently stationed at Lautoka in addition to the Officer at Suva.

83. It is clear that work on the lines I have instituted (which I consider essential to the Colony) cannot be carried out through the whole of Fiji by one man even with the assistance of lay stock inspectors.

84. The appointment of an Officer at Lautoka is more than justified by the large numbers of animals in the dry belt among which at any time an epidemic might appear.

85. There is much surgical work to be done on the plantations and there is a need for the services of a properly qualified man in connection with meat inspection and stock inspection at the port.

86. The Officer at Lautoka would be required to undertake all veterinary duties from Ra to Nadroga and in Vanualevu, assuming that the Colonial Sugar Refining Company would be good enough to give facilities for his sea transportation by their ships to Labasa.

87. The Officer at Suva would undertake administrative veterinary duties for the whole Colony and in addition would do all necessary executive work in the wet belt of Vitilevu and in the Islands of Taviuni, Lau, Ovelau and Mokogai.

88. It may be anticipated that at no distant date it may be found possible under proper precautions to remove the embargo on cattle from New South Wales, but this would only be advisable if it could be certain that the services of a qualified Veterinary Practitioner were available at the ports of entry. With one man for the whole Colony this certainty cannot be attained without serious prejudice to the work in the Colony as a whole because it would tie him too much to the port of entry.

89. In my final report I hope to be able to submit a scheme whereby the services of a Veterinary Practitioner at Lautoka can be obtained without much increased cost to the Colony over the existing estimates.

REPORT ON AN INVESTIGATION OF MATTERS AFFECTING CATTLE-PRODUCTION IN NADROGA AND COLO WEST.

By Wakefield Rainey, Government Veterinary Officer.

The investigation was made continuously between 20th May and 10th June, 1920. With the exception of cattle on the Rasikulu estate and in one or two of the most remote Fiji towns which were too wild to be herded or approached, the whole of the stock in the district was inspected and all the accessible lands from the sea to Bukuya were examined. Over 100 stallions were classified for registration or castration.

Census of Stock.

The number of cattle, sheep and horses (including mules) in the district are approximately:—Cattle, 6,500; horses, 1,000; sheep, 200.

As elsewhere in the dry belt one finds the lands capable of classification, roughly, into:—(1) Mountain; (2) foot-hill; (3) alluvial plain or flats. The alluvial land on the coast and as far up the Sigatoka river as Kavonagasau is mostly appropriated for the cultivation of sugar cane. The foot-hills in this area appear to be more fertile then those in the Province of Ba, but above Kavonagasau they are of the usual sterile order.

For those who have not traversed the Sigatoka river area it may be described roughly as a chain of alluvial flats comprising about twelve separate valleys, extending from Lawaqa near the sea to beyond Natuatuacoko, a distance of over forty miles. In addition there are a number of good if less fertile valleys or " pockets " found at various points at an angle to the main direction of the river, marking the courses of ancient tributaries. The area of this alluvial land from Rasikulu up the river may roughly be estimated at about 11,000 acres, and perhaps it may be safely described as the best land in Vitilevu for the cultivation of tropical produce.

At the present time a good deal of the land between Kavonagasau and Qalimare, and some above that point, is being used by Indians to grow maize, potatoes, and rice, but most of the area is undeveloped. Banana growing, formerly extensively and profitably carried out, appears to have been abandoned on account of a disease which made it impossible to transport the fruit. Between Qalimare and Natuatuacoko a considerable area of flat, growing guinea grass and para, is leased by two European speculators for feeding cattle.

My observations compel me to conclude that cattle production on the river is not profitable and is not likely to become profitable. On account of the relatively small rainfall, and the consequently slow growth of guinea grass and para, the best flat land will not consistently maintain cattle at a better rate that one beast to two acres, so that this area cannot compare with that of the upper Rewa and Colo East rivers where the abundant rain and luxurious growth of para enable the land properly fenced to carry cattle at the rate of one beast to the acre. At the present time there is practically no open market for cattle grown on the Sigatoka river, but even if that difficulty could be overcome and 40s. a hundred pounds could be obtained for prime beef, it would not be a profitable undertaking. It would for breeding purpose take five acres of Sigatoka river-flat to produce one prime three-year-old bullock a year; that is to say, two acres for each cow and three acres divided between the annual progeny of the cow for three years.

A three-year-old bullock at 500 lb dead weight at 40s. a hundred pounds would fetch £10, so that the gross profit on a thousand-acre run would be £2,000 or £2 per acre per annum. When rent, labour, maintenance of fencing, losses and replacement of cows, living expenses and interest on outlay were deducted there would be very little left for the farmer. At the present time with 30s. a hundred pounds for cattle delivered at the uncertain market of Suva there might be a positive loss on the undertaking.

On the other hand let us examine the gross profit to be obtained from the cultivation of tropical produce. With the increased price of cane the land would yield an average return of £30 an acre per annum if cultivated for sugar. Maize at the current price gives a gross return of £12 per acre per annum. Cotton and jute might give more. Under cattle the 11,000 acres of Sigatoka river-flat would yield a gross return of £22,000; under maize it would yield £132,000; under sugar more than a quarter of a million pounds, with at least £5,000 yearly as revenue to the Government, would be realised. I am of course not competent to assess what would be the nett profits on growing these tropical products, but it is clear that the advantage to the Colony by the expenditure in the Colony of the difference between nett and gross profits on such considerable sums of money would be great.

Neither is it my business to discuss how the labour problems may be overcome, whether by the assisted settlement of Indian small-holders and a working agreement on the subject with the Colonial Sugar Refining Company or by some other arrangement, but it is my business to point out that the difficulty of finding an adequate market for cattle from the Sigatoka river so as to yield a reasonable return to the producer and reasonable advantage to the Colony is greater than any to be apprehended in tackling the labour question.

As regards the foot-hill and mountain land there is not much of this of any value for cattle-production; such as there is would be taken up by Indian small-holders fast enough following the adequate development of the river-flats. It would be impracticable as a rule to establish cattle runs of a payable nature on foothill- land in the dry belt because of the impossibility of herding the cattle. The area of this class of land to maintain cattle in reasonable condition requires to be at the rate of between 10 and 20 acres to the beast; the cost of fencing at the present time to paddock the area necessary for a mob of 1,000 cattle would be truly enormous and would effectually prevent any sane person from undertaking the enterprise. Large cattle runs are only possible on flat or undulating land; on foot-hill runs a mob of 500 cattle on 10,000 unpaddocked acres could never be handled in the way that cattle must be handled if the enterprise is to be a commercial success. It has been suggested by some observers that, one has only to burn the reeds and to plant paspalum grass on the foothills and all will be well; I would point out that sisal hemp, reeds, bracken, Nadi grass, and the like are the only vegetation that will grow at all on most foot-hills, and that it is difficult enough to get an adequate growth of paspalum on the best land in the dry belt of Fiji.

It is interesting to observe from a high point the contours of the Sigatoka foot-hills; how from the base to within varying distances of the summit the sides of the hills or ridges are green with the vegetation of the reeds and russet pink on the tops where Nadi grass prevails. Here and there near the mountains one comes upon rich "pockets" growing every variety of grass met with in Fiji and it is the horses that have access to these "pockets" that are the best developed of all.

In contradistinction to the Rewa river, where para grass prevails, the banks of the Sigatoka river are in most places found more or less covered with guinea grass. It has the great advantage for horses that osteoporosis is not found among stock grazing on it, as one finds it among horses on para grass. Nevertheless even on guinea grass, horses do not appear to develop well on the alluvial flats. I have found no exception to the rule that the best horses are found in the lower slopes or in valleys among the mountains; the alluvial flats and foot-hills appear to be comparatively unsuitable for equine development. An interesting example of the unsuitability of bila land under para grass for horses as compared with cattle may be seen at the Fiji town of Narata where thirty cattle and twenty horses are running. The cattle are magnificient, well developed and massive; the horses are puny and wretched specimens.

Cattle and Breeding.

Some very fine cattle were seen in the district where the land was not overstocked. My observations here, taken in conjunction with those in Colo East and Mokogai, prove to my complete satisfaction that, fed adequately, there is little tendency in Fiji for cattle of European breeds to degenerate so far as beef is concerned. With abundant feed and judicious selection Fiji cattle could be graded up into nearly as good beef animals as in any other country without bringing in frzesh blood from outside the Colony. Of the cattle in Fiji perhaps 75 per cent. are underfed from calves; this circumstances far more than any other accounts for the degenerate types so frequently seen.

Horses.

The best country-bred horses of the hack type I have seen so far in Vitilevu were found in the area Vatubalavu-Busasewa-Saucoko. The horses in the mountain summit towns of Bukuya and district were disappointing; it is in the towns on the lower slopes of the mountains that one finds the best horses in this district. Below Qalimare the horses were mostly of poor physique. The best Fiji country-bred hack I have so far seen is a cream -colouredstallion running in the Busasewa " gate " leased from Fijians by an Indian. At the risk of wearisome repition I would point out that it is all a matter of feeding and freedom; the blood from which these fine hill horse have sprung is no better than that which has produced the wretched tethered animal of the Indian; the cream stallion of the Busasewa " gate " was running in mixed herbage to his knees.

Sheep.

A fine, healthy, if small, flock of sheep may be seen at Rasikulu the property of Mr. Howard. These sheep suffer from no disease and this further evidence joined to my observations on the sheep of Mr. Foulis of Tavua confirms me in my opinion that the foot-hills may find their ultimate and perhaps their only utility as grazing grounds for sheep. Sheep are more easily herded than cattle; hill lands in all countries have been preferred on this account for sheep production rather than for cattle, apart from other reasons. Wool is a staple commodity capable of easy transportation for sale in world-markets, and mutton as food is becoming acceptable to an ever increasing number of Fiji-born Indians.

Disease.

Rather more tuberculosis than in Nadi, Ba and Lautoka was found among cattle grazing along the river-flats between Qalimare and the sea, but in the worst of the large herds it did not amount to 2 per cent. of clinical cases. No tuberculosis was found among native cattle above Qalimare. Post mortem examination of a suspected case demonstrated beyond doubt the existence of actinomycosis in Fiji; I had suspected this in a case in Nadi, but was not certain. Nodular worm disease is found affecting under-fed cattle. No scabies or "mange" among horses was seen.

On the whole stock are wonderfully healthy, but a half-yearly inspection of the cattle on Bilalevu and in the adjacent areas will be necessary to control and stamp out tuberculosis. The coast area between Olosara and Korolevu also requires special attention.

Trade.

Mr. Howard of Rasikulu kills two beasts weekly to supply the fresh beef required in the district. The meat is sold, in joint with bone, at 8d. a pound. He kills his own animals consequently there is no internal trade in the supply of beef cattle. Occasionally he kills a sheep which is retailed at 10d. a pound. Two European planters on the river hold stocks of fat cattle of which the ultimate disposal is uncertain.

A canning factory is spoken of, but I seriously doubt whether it would pay to establish a meat-canning factory at present on this side of the island. I am of opinion that this is not at present the place for a canning factory; such an undertaking would more properly be established in the wet belt where there are not those ideal conditions for producing cane, maize, cotton, &c., which obtain in the dry belt.

The Colonial Sugar Refining Company would do well to make occasional purchases of prime beef on the Sigatoka river. If and when the agricultural possibilities of the river are developed there will be a better outlook for the sale of fat cattle to meet the consequently increased local demand for fresh beef. At the present time there is, to use a slang expression, "nothing doing."

REPORT ON AN INVESTIGATION OF MATTERS AFFECTING THE PRODUCTION OF CATTLE AND HORSES IN THE NAVUA DISTRICT.

By Wakefield Rainey, Government Veterinary Officer.

The investigation occupied the period 16th to 25th June inclusive. The district was entered overland from Sigatoka and all available lands and stock were inspected excepting those of the Fiji towns in the upper reaches of the Navua river where the number of animals was insufficient to justify a visit in the time at my disposal.

Census of Stock.

The approximate numbers of stock are:—Cattle, 2,500; horses, 250.

Land and Grazing.

The only available area of any real value for grazing is that adjoining the lower reaches of the river farmed at present by Mr. Chapman and a few other holders. Some of the best of this is real bila land, unsuitable for cane cultivation because of the annual flooding, but highly productive of para grass. Other portions include former cane lands that for various reasons have been thrown out of cultivation. The rest of the land in the district is either under cane or rubber, or rice, or is too swampy to be of any agricultural or pastoral value.

As with other good flat land in the wet belt, the carrying capacity for cattle may be reckoned at a beast to the acre provided there is a sufficient number of paddocks. At the present time this land is being used chiefly for fattening stores brought in from other places and it has been found possible to fatten one beast on two acres every six months or one beast per acre per annum. The undertaking yields at the present price of store cattle a fair margin of profit, but this is grazing and not cattle-production which even on this excellent land would hardly be profitable at present prices. A convenient market is found at Suva, whither the fat beasts are easily carried by punt direct from the farm to the butcher's yard, an important advantage over grazing lands on the Sigatoka river.

The hill land, in its uncultivated state, is useless for grazing purposes, and the only grass of any feeding value is the para grass.

Cattle.

Very well-finished fat cattle were seen on the para flats, but the stock on other lands showed the usual result of insufficient nourishment.

Horses.

It is not a good district for horses; only one stallion worth keeping was found, and the locally-bred animals on the whole were of poor quality. A pleasing exception to the general condition of the animals was observed at the sugar estate of Batinikia where, thanks to a maize ration of nine pounds daily, good para grass grazing and excellent management, a fine stable of working horses was seen.

Disease.

A good deal (relatively) of tuberculosis among cattle was found on two sugar-cane plantations and in the Waidabo–Waindova area of native small holdings, but elsewhere the stock were fairly clean.

Mr. Andrews, the hospital superintendent of the Vancouver–Fiji Sugar Company, kindly supplied me with photographic and other evidence of what appears to have been an outbreak of tuberculosis among certain imported horses on the Batinikia plantation. This is an exceedingly rare occurence and I regret that an opportunity was not given to me of investigating the outbreak at the time of its happening.

A few advanced cases of osteoporosis were observed among horses that had been grazed from foals on para grass.

Evidence of nodular worm disease was found.

On one estate considerable mortality is being experienced among young calves from "scour." In my opinion this is due to malnutrition of the calves resulting from overstocking. I think that while the immediate cause of death may be a specific micro-organism, this cause would not exert its effect if the calves were being adequately nourished. The remedy is to make a change, for the better, to fresh pastures and fresh water-supply after slaughtering or arranging for the separate isolated care of all calves showing symptoms of disease. Treatment by medicine is of little if any value for this condition when it occurs in epedemic form.

Trade.

There is a butchery at Navua where about two beasts weekly are killed. The butchery is supplied chiefly from the proprietor's own cattle run, but occasional purchases are made at 30s. a hundred pounds. Most of the trade in fat bullocks is in the hands of Mr. Chapman who regularly ships animals to Messrs. Sunderland at Suva. Sales of store cattle at a very low rate have been taking place recently in consequence of Indian small holders leaving the district. I do not think that any further development of the district for cattle production is possible; on the other hand I think that it will to some extent fall off in consequence of overstocking of lands. At the present price of sugar, cane-growing appears to be more advantageous than cattle-grazing on the flat lands; it is certainly more profitable than cattle-production.

EXTRACTS FROM REPORTS OF INSPECTORS.

BANANAS.

The Inspector of Produce reports on a visit of inspection to Sigatoka on 18th–24th May:—

For the first 18 miles from the bridge most of the native-owned cultivations of bananas were not in a first-class condition, and the fruit from these cultivations is not yet suitable for export. The plots on the whole do not appear to be so seriously affected as a few years ago. Higher up the river, the plantations are to all appearances sound and quite free from disease. Forty acres at Nabaka are in excellent condition. Native plantations in the Qelimare district are healthy and are bearing some magnificient bunches. There appears to be nothing to stop the shipment of considerable quantities of fruit in a few months time. The difference between certain European-owned cultivations and the native cultivations was so marked that it appears as if, in the replanting of previously affected areas, the proper selection of plants for planting and the kind of ciultvation subsequently given determine the extent to which the cultivations show signs of freedom from the conditions which have been responsible for the failure of cultivations in this district to give fruit suitable for shipment during the last few years, although this does not imply that want of proper selection and the kind of cultivation given to the plants were originally responsible for those conditions. Scale was fairly common in the whole of the district. The borer did not appear to be plentiful, and no signs of the "cabbage disease" were met with.

Maize.—A very large crop of maize has been and is being reaped, but it would appear to be desirable that a new strain of seed should be introduced.

Potatoes.—Planting has commenced, and large areas are lying ready for a supply of seed potatoes.

Peanuts.—Many Indian settlers have planted up small areas with peanuts.

Nut grass.—This weed appears to have a very strong hold in many parts of the river flats which a few years ago were quite free from it. It may be remarked that many of the areas where the weed is worst have only become infested since being leased to Indian settlers.

COCONUT SCALE.

Mr. M. A. Forsyth reports:—

The scale on Ovalau does not appear to be spreading, but it is too early to conclude, as has been suggested, that the pest is dying off. At Visoto the areas referred to in the report for last month have been dealt with and instructions were given in regard to a further isolated area. Moturiki shows little improvement and more attention will be paid the island than was possible in May. Wakaya is now comparatively free from scale. All attacked areas have been treated. In some cases where scale was found on the undergrowth such places were isolated by cutting a wide track round them, clearing the undergrowth from round the trees and running a fire through. In certain areas where this method was not practicable, the affected plants were sprayed. Enquiries are being made as to certain vessels which appear to have evaded the regulations, with a view to the necessary action being taken.

NOOGOORA BURR.

Mr. H. V. G. Rivington, who was appointed an Inspector of Plantations on 17th May, proceeded to the north coast of Vitilevu and arrived at Ba on 27th May, and reports as follows:—

Some plants were found near the railway line near Kobokobo, and on an adjoining piece of land leased to an Indian. Land at Lakinuku, where the

burr had been reported, was inspected, but none was found. There was however considerable quantities of another kind of burr* which may perhaps have been mistaken for the Noogoora burr. The weed was not seen along the Government road to this place. About 10 acres of land were found to have a fair amount of burr plants at Karavi, and also it was found on two blocks of land adjoining belonging to two Indians, as well as on the sides of the road. Notices were issued in all cases for the weed to be cleared off within 14 days. One European estate previously found to be infested with burr was inspected and no burr plants were seen. Land of an Indian adjoining, where the burr had been very bad, was also found to be clear, but next to that land burr was found and the owner notified of it and instructed to remove the weed. The weed was found on land adjoining another European estate where plants were found over about three acres. The slaughterhouse and paddocks at Rarawai were found to be free from the weed, and two blocks of land in the neighbourhood were carefully searched without coming across the burr.

INSPECTION OF FRUIT.

The s.s. " Levuka " on 24th and 25th May loaded 6,345 cases and 10,113 bunches of bananas for Melbourne, and 1,987 cases and 6,236 bunches of bananas for Sydney; equal to 33,013 bunches. Rejections at the ship's side amounted to 945 cases and 846 bunches, equivalent to 8·28 per cent. of the shipment, a considerable decrease on the last shipment. The fruit was of good quality for the time of the year. The cases were clean and well nailed. Owing to the comparatively small size of the shipment, much of the insulated space was not filled. The fruit was carefully handled and well stacked, air vents and holes were ample, and plenty of dunnage was provided. At the commencement of loading the temperature of the cool-air delivery was 22° F.

The s.s. " Atua " on 12th June took fruit equivalent to 1,700 bunches of bananas, shipped by one shipper, to Australia.

The s.s. " Navua " on 16th June loaded 17,890 cases and 42 bunches for New Zealand. The rejections amounted to 15 per cent of the shipment. The fruit, on the whole, was fair to medium in quality. Considerable quantities of ripe fruit showed in each punt, which accounted for the rather heavy rejections. Some excellent fruit from Sigatoka was included. A considerable number of cases were packed very loosely, many of the cases being at least one row of fruit short, and some in repacking had room for five dozen more fingers. A large amount of inferior fruit was included in the cases. Better supervision is required during packing. The cases were clean and well nailed. The holds were extremely well stowed, air vents were plentiful and dunnage was ample. The fruit was carefully handled and well stacked. All fruit was carried in the holds.

By the s.s. " Navua " some maize and kumalas were also exported. The former was attacked by the maize moth and the shippers were advised not to send it. Kumalas appear to find a ready sale at renumerative prices.

The s.s. " Levuka " on the 22nd June took 13,869 bunches and 6,773 cases, equivalent to 27,415 bunches of bananas. The fruit was generally only medium in quality, a large proportion having been cut rather thin. A great improvement was noticed in the fruit in the punts since only a very small quantity of ripe fruit was met with. The rejections amounted to 8·2 per cent. of the shipment, many of the rejections being due to too loose packing. The fruit was carefully handled and stowed. Live scale was found in a few punts. The cases were clean and well nailed.

* This is being investigated.—Ed.

METHOD OF CURING HIDES.

The following notes are prepared by the Government Veterinary Officer in reply to a request for information as to curing hides. The difficulty experienced by our correspondent is that no matter how much salt was used, weevils attacked the skins.

1. Immediately after skinning, the hide should be placed stretched out hair-side downwards under cover or protection from sun and rain.
2. Ten pounds or more of salt must be used for each hide, well rubbed in and well sprinkled over it.
3. In addition to the above, the hide should be well sprinkled with either (*a*) ½ lb of boracic acid or (*b*) ½ per cent solution of arsenite of soda.
4. The hide should be left for 14 days when it may be rolled up for export.

The boracic acid has the advantage of keeping the hide soft, thus facilitating the operation of rolling it into a bundle. Arsenite of soda may be purchased in the form of a commercial arsenical cattle dip. Information as to where satisfactory brands may be obtained will be forwarded on application. It may also be made by boiling together 1 lb of white arsenic and 2 lb of washing soda in 1 gallon of water until all is dissolved. With ordinary commercial white arsenic this solution so obtained may be taken roughly as 10 per cent. strength. For use it should be diluted 1 in 20

DISTRIBUTION OF SEED.

Seed from India of the varieties mentioned below has been received by the s.s. "Ganges" and distributed to the places referred to in the following list:—

Place.	*Paddy, Lal.*	*Millet, Bajra.*	*Pulse, Sora Moong.*	*Rape, Sarson.*	*Pea, Mattar.*
	lb	lb	lb	lb	lb
Ba	46	50	52	29	13
Lautoka	46	50	52	29	13
Nadi	46	50	52	29	14
Nadroga	46	50	52	29	13
Rewa	46	50	52	29	—
Navua	46	50	52	29	—
Rakiraki	69	75	78	43½	19½
Naiserilagi	23	25	26	14½	6½
Momi	23	25	26	14½	6½
Maro	23	25	26	14½	6½
Tavua	23	25	26	14½	6½
Tawarau	23	25	26	14½	6½
Government Plantation ..	123½	55	61	35	19½

Four tons of Cape barley seed has been distributed as follows:—Sigatoka, 20 bags; Lautoka, 5 bags; Nadi, 11 bags; Momi, 2 bags; Maro, 3 bags; Rakiraki, 7 bags; Naiserilagi, 3 bags; Ellington, 1 bag; Tavua, 1 bag; Tawarau, 1 bag; Savusavu, 1 bag.

PARASITES FOR COCONUT SCALE FROM TAHITI.

Mr. H. W. Simmonds, who was sent to Tahiti in February to find, and try to introduce into Fiji, a parasite for the coconut scale, reports that two parasites appear to be at work on the scale in that group and that one or both are quite effective in keeping the pest in check. One of these parasites uses several different scale inscets as hosts hence the utility of the parasite is not confined to the one scale.

Mr. Simmonds forwarded tubes containing parasitised scale-infested material by post on 18th March, 14th April and 20th April. The first lot arrived mouldy, and although many parasites were present, having bred out during the journey, none were alive. Mr. Simmonds was asked to arrange for more ventilation in the next lots and both the second and third consignments contained living parasites, all of them being of one species however. These insects were liberated at Nasinu Station on certain patches of scale and the material in the tubes was destroyed.

On 22nd May Mr. Simmonds sent off from Tahiti three coconuts in tubs, on the leaves of which were parasitesid scale. The whole plant in each tub was enclosed in hessian. The plants arrived by the R.M.S. " Makura " on 13th June. Several of the leaves showing most scale had dried up during the journey, but a fair amount of scale was still alive. The palms were taken to the island of Moturiki and during the journey there the leaves and stems were carefully inspected for possible pests other than scale. Dead parts were cut away and together with the hessian were thrown overboard. On arrival at Moturiki arrangements were made for planting the palms among the scale-infested cultivations. The palms were removed from the soil in the tubs and were then taken ashore and planted, the soil being turned out into the sea. A number of dead scale insects appeared to have been killed only recently which suggested that the parasites were active, but since the scales were not extremely plentiful, it was considered advisable to waste none by examining for evidences of parasitism.

Both the parasites referred to belong to the family *Chalcididae* of the order *Hymenoptera*, a family which is composed chiefly of small parasitic insects.

Mr. Simmonds is bringing a further consignment of the parasites on his return.

DEPARTMENTAL NOTES.

The Government Veterinary Officer returned to Suva from Navua at the end of June, having completed the inspection of cattle and horses, &c., in Colo East, Colo North, Ba, Lautoka, Nadi, Nadroga, Colo West and Navua. Colonel Rainey's reports on these visits of inspection have appeared in the Circular.

Mr. Rivington, Inspector of Plantations, is inspecting for Noogoora Burr in the coastal districts from Ba River to Rakiraki.

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